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March 6, 2003

Box Non-Fee Amendment  
Commissioner for Patents  
Washington, D.C. 20231

Re: U.S. Patent Application Serial No. 09/352,093  
Title: *Ultra-High Efficiency Turbine and Fuel Cell Combination*  
Inventors: Michael S. Hsu, et al.  
Filing Date: July 14, 1999  
Attorney Docket No. HSE-020RCE (formerly HSE-020CPCN2)

Dear Sir:

I enclose herewith for filing in the above-identified application the following:

1. Amendment and Response (4 pages);
2. Proposed Request for Interference Pursuant to 37 C.F.R. §1.607 (8 pages); and
3. Pre-paid acknowledgment postcard.

Please charge any necessary fees to our Deposit Account No. 12-0080. The undersigned requests any extensions of time necessary to respond. *A duplicate of this sheet is enclosed.*

**Certificate of First Class Mailing (37 CFR 1.8(a))**

I hereby certify that this correspondence is deposited with the United States Postal Service as first class mail in an envelope addressed to: Box Non-Fee Amendment, Commissioner for Patents, Washington, D.C. 20231 on:

March 6, 2003

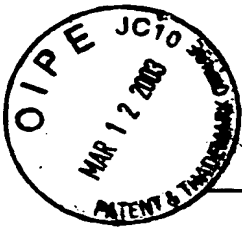
Date

*John S. Curran*  
John S. Curran Registration No. 50,445

Respectfully submitted,

LAHIVE & COCKFIELD, LLP

*John S. Curran*  
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Registration No. 50,445  
Attorney for Applicants



# PROPOSED

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:

**Michael S. Hsu and Ethan D. Hoag**

Serial No.: 09/352,093

Filed: July 14, 1999

For: **ULTRA-HIGH EFFICIENCY TURBINE  
AND FUEL CELL COMBINATION**

Attorney Docket No.: **HSE-020RCE**  
(Formerly HSE-020CPCN2)

Group Art Unit: 1741

Examiner: **Donald R. Valentine**

Commissioner for Patents  
Washington, D.C. 20231

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Date	

## REQUEST FOR INTERFERENCE PURSUANT TO 37 C.F.R. §1.607

Pursuant to 37 C.F.R. §1.607, Applicants request that an interference be declared between the present application and United States Patent No. 5,811,201 (the "Skowronski '201 patent" – Exhibit A), granted September 22, 1998 to Mark J. Skowronski.

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## Proposed Count I

Pursuant to 37 C.F.R. §1.607(a)(2), Applicants present the following proposed Count I:

A process for generating electricity utilizing an integral, power generator comprising a compression stage, a turbine stage, and an electricity generation stage, the process comprising the steps of:

- (a) compressing an oxygen-containing gas in the compression stage;
- (b) heating at least some of the compressed gas in a heating stage;
- (c) introducing fuel and the compressed heated gas into an electrochemical converter for oxidizing the fuel therein to produce electricity, said electrochemical converter also producing hot exhaust gas;
- (d) driving the turbine stage with a turbine drive gas comprising electrochemical converter exhaust gas, the turbine stage driving the electricity generation stage and the compression stage, the generation stage generating electricity; and
- (e) withdrawing spent electrochemical converter exhaust gas and introducing the spent gas into the heating stage for heating the compressed oxygen-containing gas.

## REMARKS

### The Prior Interference

Applicants request that an interference be declared between Claims 1 and 4-8 of the Skowronski '201 patent and Claims 53-58 and 62-64 of the present application. Applicants propose Claim 53 of the present application as the Count. Claims 1 and 4-8 of Skowronski '201 correspond substantially to the proposed Count while Claims 53-58 and 62-64 of Applicants' application correspond exactly or substantially to the proposed Count. The proposed Count also corresponds substantially to Count I of a previous interference between the parties ( Patent Interference No. 104, 561 ) in

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which Applicants were awarded judgment after Skowronski requested and accepted an adverse judgement. The previous interference covered Claims 10-13 of Skowronski '201 and Applicants' Claims 53-65 in Applicants' application. The present application is a RCE continuation of the application in interference. At the time of judgement, Applicants' Preliminary Motion No. 2, which sought to add Claims 1 and 4-8 from the Skowronski '201 patent to the interference, was pending but it was not ruled on due to the judgement being issued.

The Skowronski '201 patent issued on September 22, 1998, based upon United States Patent Application 689,702, filed on August 16, 1996. The Notice (Exhibit B) declaring the prior interference designated Claim 10 of the Skowronski '201 patent as the single Count. Claims 10-13 of the Skowronski patent and Claims 53-65 in Applicants' application were the subject matter of the previous interference.

## Correspondence of the Claims and the Proposed Count

Proposed Count I contains all of the patentable elements of Claim 1 of the Skowronski '201 patent. While Count I lacks an explicit recitation of the 50,000 rpm limitation, and the limitation that the stages of the power generator be located on a single shaft, these elements do not provide a patentable distinction. The 50,000 rpm limitation was known to those of ordinary skill in the art at the time the application for the Skowronski '201 patent was filed. Specifically, this was disclosed in the prior art, including Seymour, U.S. Patent No. 5, 727, 378 (Exhibit C), Nomura, U.S. Patent No. 5, 519, 305 (Exhibit D), and Mackay, U.S. Patent No. 4, 754, 607 (Exhibit E). Similarly, power generators with the stages located on a single shaft were also well known in the art at the time the Skowronski '201 patent was filed ( *See* Seymour U.S. Patent No. 5, 727, 378 ( Exhibit C ) and ( Declaration of William K. Bushnell ( Exhibit J ) ). The proposed Count I includes both in-line (in an in-line generator, the stages are located on a single shaft) and out-of-line power generators.

Although the proposed Count I includes all of the patentable elements of Skowronski '201, there are a couple of minor terminology differences. Proposed Count I uses the term "electrochemical converter" in place of the term "fuel cell" used

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in the Skowronski '201 patent. The term "electrochemical converter" is well understood in the art to be another label for a fuel cell. Additionally, proposed Count I indicates the electricity generation stage generates "electricity" rather than specifying that it generates "alternating current electricity." The term "alternating current electricity" used in Skowronski '201 patent refers to a form of "electricity" and it is well understood in the art that power generators may be used to produce alternating or direct electrical currents/electricity. The term "electricity" includes both alternating and direct currents.

Claim 4 of the Skowronski '201 patent (which depends from claim 1 ) corresponds substantially to proposed Count I. Claim 4 merely adds to Claim 1 the limitation of providing to the turbine "sufficient compressed oxygen-containing gas that the turbine drive gas has a temperature sufficiently low that the turbine stage is not damaged by the turbine drive gas." This limitation was known to those of ordinary skill in the art at the time the application for the Skowronski '201 patent was filed . Specifically, this limitation is disclosed in prior art patents including Horner, U.S. Patent No. 5, 724, 806 (Exhibit F), Nishijima, U.S. Patent No. 5, 185, 997 (Exhibit G), and Arpalahti et al, U.S. Patent No. 5, 370, 772 (Exhibit H).

Claim 5 of the Skowronski '201 patent corresponds substantially to the proposed Count I. Claim 5 depends on Claim 4 and merely adds the explicit requirement that the fuel cell operate at a higher temperature than the turbine stage. This element of Claim 5 is disclosed in the prior art, including in Hendriks et al, U.S. Patent No. 5, 083, 425 (Exhibit I), and thus was known to those of ordinary skill in the art before the application for the Skowronski '201 patent was filed.

Claim 6 of the Skowronski '201 patent is identical to Claim 5 but it depends on Claim 1 while Claim 5 depends on Claim 4. Thus, the only difference from Claim 1 is the explicit requirement that the fuel cell operate at a higher temperature than the turbine stage, something well known in the prior art. Claim 6 thus corresponds substantially to the proposed Count I.

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Claim 7 of the Skowronski '201 patent also corresponds substantially to proposed Count I. Claim 7 depends from Claim 4 and merely adds the limitation of "rectifying the alternating current to direct current, and inverting both direct currents to low frequency alternating current." The conversion of direct current to alternating current and back was known to those of ordinary skill in the art before the application for the Skowronski '201 patent was filed. (See Declaration of William K. Bushnell – Exhibit J).

Claim 8 of the Skowronski '201 patent corresponds substantially to the proposed Count. Claim 8 depends on Claim 4 and merely adds the requirement that the low frequency alternating current electricity to be at about 50 to 60 Hz. This is the standard frequency for alternating current in the United States and is shown in a multitude of references including the Clegg, U.S. Patent No. 4, 508, 996 (Exhibit K). This limitation of Claim 8 was known to those of ordinary skill in the art before the application for the Skowronski '201 patent was filed.

The following chart shows the specific correspondence between Claims 1 and 4-8 of the Skowronski '201 patent and proposed Count I. Where the designation "prior art" appears, the claim elements are disclosed by prior art.

Skowronski Claim	Proposed Count I
1. A process for generating electricity utilizing an integral, power generator comprising a compression stage, an electricity generation stage, and a turbine stage all on the same shaft, the process comprising the steps of: (Skowronski col. 5, lines 57-60)	A process for generating electricity utilizing an integral, power generator comprising a compression stage, a turbine stage, and an electricity generation stage, the process comprising the steps of: (all on same shaft limitation is prior art)
(a) compressing an oxygen-containing gas in the compression stage;	(a) compressing an oxygen-containing gas in the compression stage;

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(Skowronski col. 5, lines 61-62)

(b) heating at least some of the compressed gas in a heating stage;  
(Skowronski col. 7, lines 63-64)

(c) introducing fuel and the compressed heated gas into a fuel cell for oxidizing the fuel therein to produce electricity, the fuel cell also producing hot exhaust gas;  
(Skowronski col. 5, lines 65-67)

(d) driving the turbine stage with a turbine drive gas comprising fuel cell exhaust gas,  
(Skowronski col. 6, lines 1-2)

the turbine stage being driven at a speed of a least 50,000 rpm,  
(Skowronski col. 6, lines 2-3)

the turbine stage driving the electricity generation stage and the compression stage,  
(Skowronski col. 6, lines 3-5)

the generation stage generating alternating current electricity; and  
(Skowronski col. 6, lines 5-6)

(e) withdrawing spent fuel cell exhaust gas from the turbine stage and introducing the spent gas into the

(b) heating at least some of the compressed gas in a heating stage;

(c) introducing fuel and the compressed heated gas into an electrochemical converter for oxidizing the fuel therein to produce electricity, said electrochemical converter also producing hot exhaust gas;

(d) driving the turbine stage with a turbine drive gas comprising electrochemical converter exhaust gas,

Prior art

the turbine stage driving the electricity generation stage and the compression stage,

the generation stage generating electricity; and  
(designation of electricity as alternating current is prior art )

(e) withdrawing spent electrochemical converter exhaust gas and introducing the spent gas into the heating stage

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heating stage for heating the  
compressed oxygen-containing gas.  
(Skowronski col. 6, lines 7-10)

for heating the compressed oxygen-  
containing gas.

4. The process of claim 1 wherein the  
turbine drive gas comprises sufficient compressed  
oxygen-containing gas that the turbine drive gas  
has a temperature sufficiently low that the turbine  
stage is not damaged by the turbine drive gas.  
(Skowronski col. 6, lines 19-22)

Prior art

5. The process of claim 4 wherein the fuel cell  
operates at a higher temperature than does the  
turbine stage.  
(Skowronski col. 6, lines 23-24)

Prior art

6. The process of claim 1 wherein the fuel cell  
operates at a higher temperature than does the  
turbine stage.  
(Skowronski col. 6, lines 25-26)

Prior art

7. The process of claim 1 comprising the  
step of rectifying the alternating current to direct  
current, and inverting both direct currents to low  
frequency alternating current.  
(Skowronski col. 6, lines 27-29)

Prior art

8. The process of claim 1 wherein the low  
frequency alternating current electricity is at about  
50 to about 60 Hz.  
(Skowronski col. 6, lines 30-31)

Prior art

Proposed Count I is copied verbatim from Applicants' pending claim 53.  
Applicants' pending claims 54-58 are dependent upon claim 53 and correspond to the  
proposed Count. Claim 62 also corresponds to the proposed Count I. Claim 62



# PROPOSED

includes an additional limitation that the compression stage, turbine stage and the electricity generation stage of the integral, power generator are all on the same shaft, a limitation well-known in the prior art, but does not require the feedback of exhaust gas for use as a preheater of the compressed oxygen-containing gas.. Steps (a) through (d) of Claim 62 are all included in proposed Count I. Since the only difference is the well-known limitation that the power generator stages be located on the same shaft, Claim 62 corresponds to the proposed Count I. Claim 63 and 64 are dependent upon Claim 62 and also correspond to the proposed Count. In fact, Claim 63 merely adds step (e) of the proposed Count I.

The requirements of 35 U.S.C. §135(b) are satisfied as Applicants' pending Claims 53-58 and 62-64 were initially filed in a Second Amendment on September 20, 1999. The Skowronski patent issued on September 22, 1998, less than one year prior to Claims 53-58 and 62-64 being added to the application. The RCE was filed on August 8, 2002, amending Claims 53, 56, and 62, to provide proper antecedent support in the preamble for several claim elements. Nothing was substantively changed. Thus, claims 53-58 and 62-64 were pending less than one year after the issuance of the Skowronski '201 patent and the requirements of 35 U.S.C. §135(b) have been met.

## Conclusion

Since Claims 1 and 4-8 of Skowronski '201 and Claims 53-58 and 62-64 correspond to the proposed Count, an interference should be instituted between the parties.

Respectfully submitted,  
Attorneys for the Applicants

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